

**Report of the Madison Area Citizen Consensus Conference on
Nanotechnology**

April 24, 2005

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For three Sundays in April a group of thirteen Madison area citizens from a variety of backgrounds gathered to participate in an innovative democratic process for obtaining lay perspectives on the future development of technologies. Area residents met to consider nanotechnologies, which involve the manipulation and manufacture of materials on the nanometer scale. A nanometer is one millionth of a millimeter or one eighty thousandth the width of a human hair. Developments in research technologies now allow scientists and engineers to manipulate particles this small and are making it possible for researchers to create an array of technologies that are likely to have profound and unprecedented effects from medicine and agriculture to the military and transportation. Because of their extremely small size, nanomaterials may behave in unexpected and potentially harmful ways in our environment and in human bodies. The uncertain behavioral characteristics of nanomaterials and the wide array of applications of nanomaterials demand that citizens carefully consider the field of nanotechnology before a large number of products based on nanomaterials are developed.

Modeled on a deliberative process pioneered in Denmark in the 1980s, Madison's first consensus conference aimed to allow area citizens to consider the promises and perils of the many possible future nanotechnologies before they reach the market. Citizen panelists received a packet of background reading and then met to discuss the readings and develop a list of questions about the technology. At their second meeting, participants gathered with a group of seven specialists from a range of fields, including engineering, toxicology, policy analysis, communications, and bioethics. These specialists addressed the citizens' questions in a public forum.

There are two premises of the consensus conference approach. First, in democracy, we assume that citizens are entitled to a say in all matters that affect their lives. Science and technology are often treated as an exception to this value. Consensus conferences aim to eliminate this exception and are based on the belief that citizens are entitled to a say on decisions about technologies that may affect their lives. Second, consensus conferences are based on the belief that lay people are able to understand complicated technical matters and sometimes can offer insights that experts do not consider.

The organizers of this citizen forum on nanotechnology as well as the citizen participants hope that government officials, scientists, the media, and area residents will pay careful attention to the conclusions and recommendations developed during Madison's first consensus conference on nanotechnology.

On the basis of their reading and two discussion sessions (one on their own and one with a panel of experts), citizen panelists drafted the recommendations that follow.

HEALTH & SAFETY REGULATIONS

* We recommend that the government develop a clear and precise definition of nanotechnology. This is necessary in order to determine which products should fall under any nanotechnology-related regulations.

*Given the unique physical characteristics of nanomaterials, we recommend the burden of proof of the safety of new products should be on the producers of products that have nanomaterials in them. In other words, producers should be required to prove their products are safe, rather than consumers being required to prove these products are unsafe.

* We recommend the development of specific health and safety testing processes for nanomaterials. We recommend that all testing on products that do not include nanoscale materials be repeated when such materials are added to the product. Test results should include disclosure of substances in products using nanomaterials, but also information on the effects of interactions between all materials that make up the product.

MEDIA COVERAGE AND INFORMATION AVAILABILITY

*The public needs more in-depth information on nanotechnology research and product development. We recommend increased coverage in the popular media (e.g., *National Geographic* and public television) and conferences on nanotechnologies for lay citizens. Local media should inform people about nanotechnology research and development occurring in the community.

*We recommend the labeling of products using nanomaterials. Such labels should distinguish between those nanoscale materials that are naturally occurring and those that are not.

*We recommend that a method for informing the public specifically of potentially harmful effects of nanomaterials should be instituted by the government. This could include warning labels (similar to tobacco products), or some other appropriate precautions to protect consumers.

*We recommend a shared-access database to exchange information in order to make it easier for scientists to gain from one another's knowledge.

*We recommend that publicly-funded research institutions widely circulate, including through the popular media, statements of purpose for research for which grants are applied.

*We recommend that scientists regularly report on funding of and results of research in a way that is accessible to lay people. These reports should appear free of jargon in mainstream publications (e.g. the largest circulating newspaper in a given locale). These

reports should include a statement of the potential risks of any products likely to result from the research.

*We recommend that the public have access to the results of nanomaterial safety and toxicity tests done by private corporations.

CREATION OF GOVERNMENT BODIES

*We should not assume that existing health and safety regulations are adequate to cover products made with novel nanomaterials. Therefore, we propose the formation of a government body, including a wide spectrum of participants, that is responsible for regulation of public and private nanoscale research and development. Specifically, this body should monitor safety, production, research, applications, information accessibility, waste by-products, and potential side effects and risks. It should be based on two principles: 1) that researchers and organizations involved in product development must prove the safety of the materials with which they work and the products they develop; 2) that research must always be contingent on an assessment of associated risk.

*We recommend the formation of an international agency that would consider nanotechnology issues.

RESEARCH AND RESEARCH FUNDING

*We recommend increasing research on and development of nanomaterials, but we believe that products using nanoscale materials should be kept off the market until more is known about their human health, environmental, and social effects.

*We recommend that all government funding, including grants, for scientific research include ethical considerations and interdisciplinary oversight.

*We recommend the extension of “whistle-blower” protection status to scientists who publicly raise concerns about ethical considerations of research, including nanoscale science and engineering.

*We recommend more research on the health and societal impacts of nanotechnology. At this time, in many cases, we do not know how nanomaterials will affect human health and the environment. Our discussions with scientists suggest they are not certain either.

*We recommend that government funding for research of health and societal impacts of nanotechnology be increased.

MILITARY AND SURVEILLANCE

*We recommend that regulatory agencies not use nanotechnologies to invade citizens' privacy.

*We recommend that nanotechnology not be used to develop weaponry.

PUBLIC INVOLVEMENT

*We recommend that government provide effective mechanisms at the local, state, and federal levels for citizen involvement in nanotechnology policy development (e.g. sponsoring citizen forums).

*We recommend more public involvement in and education about the regulation process. More media coverage on nanotechnology issues would be an excellent way of achieving this.

Appendix A

Citizen Panelists

NOTE: The citizen panelists listed below participated in the three day consensus conference and endorse the recommendations that appear above. Lorry Bond participated in the first and second sessions of the conference, but was not involved in drafting the report.

Eric Erdmann, Bartender, Madison, WI

Joshua Grice, Student, University of Wisconsin--Madison

Ira Hormozi, Retired, Senior Utilities Engineer, Madison, WI

Kirsten Johnson, Teacher, Madison, WI

Jack Kear, Teacher, Madison, WI

Shadayra Kilfoy-Flores, Student, Madison Area Technical College

Erin Loiselle, Teacher, Madison, WI

Larry Miller, Retired, Middle School Principal, Monona, WI

Dick Plotkin, Retired, Business; Currently, Community Activist, McFarland, WI

Philip Raymond, Student, University of Wisconsin--Madison

Dianne Riley, Public Library Staff and Community Advocate, Madison, WI

Gail Vick, I/S Services Manager, Madison, WI

Appendix B

Specialists Who Appeared to Answer Questions at the Public Forum (April 17, 2005)

NOTE: The specialists listed below do not necessarily endorse the recommendations that appear in this report.

Karin Ellison, Research Compliance Specialist, Graduate School, University of Wisconsin-Madison.

Padma Gopalan, Assistant Professor, Department of Materials Science and Engineering and Chemistry Department, University of Wisconsin--Madison.

Bob Hamers, Professor in of Chemistry, University of Wisconsin-Madison.

Jack Kloppenburg, professor, Department of Rural Sociology, University of Wisconsin—Madison.

Clark Miller, Assistant Professor of Public Affairs, University of Wisconsin-Madison.

Bob Moore, associate scientist, School of Pharmacy and the Molecular and Environmental Toxicology Center, University of Wisconsin--Madison.

Dietram A. Scheufele, Professor in the School of Journalism & Mass Communication, University of Wisconsin—Madison.

Appendix C

Sponsors, Co-organizers, and Facilitators

The consensus conference was sponsored by the Nanoscale Science and Engineering Center at the University of Wisconsin and the UW Integrated Liberal Studies Program. Sponsorship by the entities does not imply endorsement of the recommendations made by the citizen panel.

The lead organizers of Madison's first Consensus Conference on Nanotechnology were Daniel Kleinman (associate professor of Rural Sociology at the University of Wisconsin) and Maria Powell (postdoctoral fellow in the nanotechnology and society program of the Nanoscale Science and Engineering Center). In addition, students in Integrated Liberal Studies 275/ Rural Sociology 375 taught by Daniel Kleinman at the University of Wisconsin in the spring of 2005 were involved in organizing the consensus conference.

All three sessions of the consensus conference were facilitated by Judith Adrian and Carol Lobes co-directors of the Center for Democratic Action (McFarland, Wisconsin).

Appendix D

Sources of Additional Information

- <http://www.nanotec.org.uk/finalReport.htm>
- <http://www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/5886.pdf>
- <http://www.nano.gov/>
- <http://www.nano.gov/html/news/current.html>
- <http://www.nanoforum.org/>
- www.smalltimes.com
- <http://www.cordis.lu/nanotechnology/>
- <http://www.swissre.com/> (go to site, type in nanotechnology)
- <http://www.etcgroup.org> (go to site, type in nanotechnology)